

Asthma, respiratory allergy and cough

Volume related feedback can control cough motor pattern - experiments on cats.

*Z. Kotmanova¹, M. Simera¹, M. Veternik¹, J. Jakus¹, I. Poliacsek¹

¹Jessenius Faculty of Medicine in Martin, Comenius University in Bratislava, Jessenius Faculty of Medicine in Martin (Martin, Slovakia)

The effects of volume related feedback and output airflow resistance on cough motor pattern were studied on 17 spontaneously breathing pentobarbital-anesthetized cats (3.76 ± 0.18 kg). The lung inflation during tracheobronchial cough was controlled by MERLIN ventilator (Vetronic Services UK) cycle-triggered by the diaphragm cough EMG signal.

The inspiratory and expiratory cough efforts and the inspiratory, diaphragm, cough active and total cough cycle durations increased when only the tidal volume was delivered to the respiratory tract during inspiratory phase of cough (7 animals).

When the regular cough volume was delivered to the respiratory tract during the first half of the inspiratory cough period, the amplitudes of cough related activities of diaphragm and abdominal muscles, maximum inspiratory oesophageal pressure, and the duration of cough inspiratory phase decreased, simultaneously the active part of cough expiratory phase prolonged (7 animals). The control inflations with cough volume during appropriate cough inspiratory time (7 animals) as well as the control coughs with expirations guided through the ventilator output (provided additional airflow resistance, 6 animals) resulted in increased values of maximal expiratory esophageal pressure, duration of cough active expiratory phase, duration of cough abdominal activity, and duration of active part of cough cycle. No changes were found in control coughing either with ventilator connected or disconnected completely from the tracheal cannula.

Modified lung inflations during coughing and/or additional expiratory airflow resistance modify the shape of cough motor pattern via the volume related feedback mechanism similar to that during quiet breathing.

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